

### **REMARKS**

This amendment is responsive to the Office Action of April 4, 2007. Reconsideration and allowance of claims 1-16 are requested.

#### **The Office Action**

Claims 1-13 stand rejected under 35 U.S.C. § 102 as being anticipated by Zhu (US 7,009,396; US 2004/0051529).

Claim 13 stands rejected under 35 U.S.C. § 101.

#### **The Present Amendment**

The present inventors made the present invention prior to the filing date of the Zhu patent/application. Note the attached Invention Disclosure and ID Abstract (with blacked out dates) which predates the September 12, 2002 filing date of Zhu. The applicants are preparing a Declaration and arranging for its execution to formally swear behind the Zhu reference.

#### **The References of Record**

Zhu (US 2003/0004408) discloses a method for producing an image of a volume of interest using an MRI system in which a plurality of undersampled data sets are generated for a plurality of regions of the volume of interest along an axis of translation. Although the individual data sets may be undersampled, the data sets are overlapping such that an elongated complete data set is formed (albeit with undersampled regions extending from the leading and trailing edges). There is no suggestion of using parallel imaging techniques or of unfolding fold-over artifacts.

Zhu (US 7,009,396; US 2004/0051529) expounds upon the earlier Zhu technique. There is a single paragraph of Zhu '396 which references parallel imaging techniques such as SENSE (column 8, lines 28-61; [0043]). However, Zhu teaches that such parallel imaging techniques lead to undesirable view-to-view changes that may cause significant ghosting artifacts (column 8, lines 50-51). Two strategies for dealing with this problem are addressed. The first is redesign the receive coil array 300 which is fixedly attached to the bore and does not move with the patient. The

actual parameters of this strategy are not set forth. The second strategy is set forth with even less specificity.

**The Claims Distinguish Patentably  
Over the References of Record**

**Claim 1** calls for unfolding fold-over artifacts. Zhu at column 8, lines 50-51 teaches against parallel imaging. Further, Zhu fails to disclose unfolding fold-over artifacts due to undersampling by means of a sensitivity pattern of a receiver antenna and/or properties of selected factors determining the receive situations. Accordingly, it is submitted that **claim 1 and claims 3-5 and 14-16 dependent therefrom** are not anticipated by Zhu.

**Claim 2** calls for unfolding fold-over artifacts using the sensitivity patterns of the receiver antennae and at least one of the excitation profile, a magnetization and presaturation profile, or a frequency-response pattern of a receiver. Zhu fails to disclose such an unfolding technique and fails to suggest or motivate others to perform the claimed unfolding technique. Accordingly, it is submitted that **claim 2** is not anticipated by Zhu.

**Claim 6** calls for a global receiver antenna disposed in a fixed relationship to the main magnet system and a plurality of local receiver antennae disposed in a fixed relationship with the patient to move with the patient. By contrast, in Zhu, the receive coils 152 and 300 are both stationarily mounted relative to the main magnet system. Zhu fails to recognize the improved reconstruction quality that is achieved using local receiver antennae that move with the patient.

**Dependent claims 8 and 9** go into greater detail regarding how to obtain the sensitivity parameters of moving receiver coils. Zhu neither discloses nor suggests moving receiver coils, much less how one would determine their sensitivity patterns. Accordingly, it is submitted that **claim 6 and claims 7-9 dependent therefrom** are not anticipated by Zhu.

**Claim 10** has been placed in independent form including all of the subject matter from parent claim 1. Claim 10 calls for the unfolding and image processing steps which finds antecedent basis in Figures 4a-4h of the present application. Specifically, claim 10 calls for subtraction, which finds antecedent basis when part of Figure 4f is subtracted from its folded counterpart to produce the results shown in

Figure 4h. Zhu is devoid of any suggestion of using such a subtraction step in the processing of folded data. Accordingly, it is submitted that **claim 10** is not anticipated by Zhu.

**Claim 11**, among other limitations, calls for unfolding of fold-over artifacts to be by means of the sensitivity pattern of the receiver antenna and by at least one of the excitation profile, a magnetization and presaturation profile, and a frequency response pattern of a receiver that demodulates the signals sampled by the at least one receiver antenna. These limitations are not disclosed by Zhu. Accordingly, it is submitted that **claim 11** distinguishes patentably over Zhu.

**Claim 12** calls for the receiver antennae to include at least one global receiver antenna disposed in a fixed relationship to the main magnet system and a plurality of local receiver antennae disposed in a fixed relationship to a patient on the table. Zhu fails to disclose such a receiver antennae construction. Accordingly, it is submitted that **claim 12** is not anticipated by Zhu.

**Claim 13** calls for the generation of the image to include unfolding in conjunction with the sensitivity pattern of the receiver antenna and at least one of the excitation profile, the magnetization and presaturation profile, or the frequency-response pattern of the receiver. Not only does Zhu not disclose these limitations, Zhu also fails to reasonably suggest them. Accordingly, it is submitted that **claim 13** distinguishes patentably over Zhu.

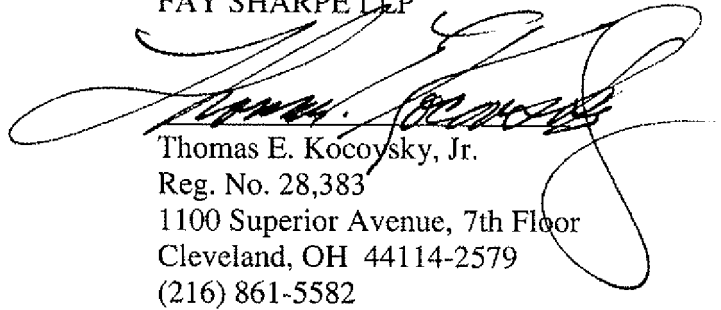
### **CONCLUSION**

For the reasons set forth above, it is submitted that claims 1-16 distinguish patentably over the references of record and meet all statutory requirements. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case, she is requested to telephone Thomas Kocovsky at (216) 861-5582.

Respectfully submitted,

FAY SHARPE LLP



Thomas E. Kocovsky, Jr.  
Reg. No. 28,383  
1100 Superior Avenue, 7th Floor  
Cleveland, OH 44114-2579  
(216) 861-5582